

Historic American Engineering Record

SC-5

ABBEVILLE HYDROELECTRIC POWER PLANT
ROCKY RIVER, 3.2 MILES WEST OF STATE HIGHWAY 284
ABBEVILLE COUNTY
GEORGIA

HAER,

SC,

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PHOTOGRAPHS

Historic American Engineering Record
National Park Service
Department of Interior
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Location: Beginning at the intersection of South Carolina State Highway 284 and Abbeville County Road 72, proceed west on County Road 72, 3.2 miles to the site located across the Rocky River.

UTM: 17.351800.3791680
Quad: Abbeville

Date of Construction: Dam begun in 1933. Dam and Power Plant completed in 1940.

Present Owner: Abbeville Water and Electric Plant Co.
Abbeville, South Carolina

Present Use: Hydroelectric Power Plant

Significance: J. Roy Pennell acquired property and began construction of the multiple arch reinforced concrete dam in 1933. Pennell abandoned the project in 1935 and it was completed by the City of Abbeville with Public Works Administration funds in 1940. The two original S. Morgan Smith hydro turbines are still in operation. In 1946 the plant was enlarged and a Bush Sulzer diesel engine acquired to provide auxiliary power. The facility remains in operation today.

Historian: John P. Johnson, September 1980

ABBEVILLE HYDROELECTRIC POWER PLANT

The Abbeville Hydroelectric Power Plant is located 17 miles northwest of the City of Abbeville on the Rocky River in Abbeville County, South Carolina. The dam, power house and transmission lines are owned by the Abbeville Water and Electric Plant Company, a municipal corporation. Construction for the project was begun by a private corporation in 1933 and completed (with the assistance of Federal funds) by a municipal corporation in 1940.

James Roy Pennell, a 1910 civil engineering graduate of the University of South Carolina, began acquiring land and water rights along the Rocky River in the early 1930s. Land was acquired in the vicinity of Price's Grist Mill for Pennell's hydroelectric power project. In January 1933 Pennell, a citizen of Spartanburg, and W. H. White of Abbeville applied to the South Carolina Secretary of State to charter the Abbeville Power Company, Inc. In February the South Carolina Senate approved the charter for the purpose of providing inexpensive electricity to rural locations. Pennell and White announced that about 1,200 acres would be inundated by construction of a 60' high and 570' long reinforced concrete dam. The reservoir created by the dam was to be 7 miles long and a maximum of three-quarters of a mile wide. Stone aggregate for the concrete was to be quarried and crushed on the site. Pennell indicated that the project would use local labor and estimated it would cost approximately \$150,000.

Upon learning of it, Duke Power Company and the Southern Public Utilities Company immediately objected to Pennell's private hydro project. In response, Pennell announced that 90 percent of the land had been acquired and that the project was already underway. Construction began on June 22, 1933, when rock crushing machinery began operating near the dam site. At this time, Pennell announced that the dam would be increased to 75' high and 575' long. Pennell estimated that 2,000 HP could be produced by a hydroelectric facility at the site. In September 1933, the D. M. Rickenbacker Construction Company of Union, South Carolina, was contracted to build the multiple arch reinforced-concrete dam. The project was expected to be completed in 8 months and to employ 100 men.

In January 1934, Pennell announced that the dam would be increased to 80' (its present height) with the capacity to develop 4,600 H.P. The lake would stretch 10.5 miles up the Rocky River and impound approximately 1,400 acres. Pennell announced that 42 separate tracts of land had been acquired for the reservoir and that only 6 remained to be purchased. At this time the planned lake was referred to as Pennell Lake. In May 1934, the Southern Public Utilities Company objected to the proposed construction of rural power lines by the Abbeville Power Company. However, in June the South Carolina Railroad Commission (predecessor to the Public Utilities Commission) granted the local power company authority to construct power lines to rural areas not being serviced by the larger power companies.

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By May 1935, Pennell and White abandoned the project with the dam only 80 percent complete. Presumably they ran out of money to finance the project. C. P. Townsend, City Engineer of Abbeville from 1920 until 1948, recommended that the city take over the project and seek Federal funds to complete the abandoned dam works. The Atlanta engineering firm of Wideman and Singleton was contracted to prepare plans for completion of Pennell's project. In June 1935, the Abbeville City Council applied to the Federal Public Works Administration (PWA) for a loan to complete the Rocky River hydro project. The council applied for nearly \$500,000: \$154,000 to cover the cost of Pennell's land investment and construction costs; and \$350,000 to complete the dam, highway bridge above the dam, power station, penstocks, power generating equipment, and transmission lines.

Approval of the PWA loan was held up pending resolution of a court suit concerning the legality of Federal funds being used to finance municipally owned electric generating plants.

Fifty-one projects throughout the United States, involving more than 25 million dollars, were held in abeyance until the U. S. Supreme Court ruled in Duke Power Company et al. vs. Greenwood County et al. that Federal funds could be used to finance municipally owned electric plants. This decision, made in December 1936, freed PWA funds for the development of the Rocky River hydroelectric project.

In November 1938, the City of Abbeville secured the land and water rights for the Pennell project. At that time 215 acres remained to be purchased. The deed was not recorded until August 1939. Pennell and his associates had invested \$214,000, yet the City was able to purchase the abandoned project for \$135,000. Dam construction was resumed on August 28, 1939, with John B. Britton, State Senator from Sumter County, as the principal contractor.

In November 1940, the concrete dam and two-story brick power house were completed and the spillway was closed. The Rocky River began to back up at the rate of one foot per day. The lake was named Secession Lake to commemorate Abbeville's mark on Civil War history: the first town to secede from the Union in November 1860. The site has since been referred to as the Abbeville Hydroelectric Power Plant, Rocky River Project. On December 3, 1940, the turbines were engaged and electricity from the generators was first transmitted.

The principal hydroelectric equipment, installed in 1940, is still in service. The plant was constructed for two hydro turbines, manufactured by the S. Morgan Smith Company of York, Pennsylvania. They both operate under 80' of head. The smaller turbine was built to operate at 400 rpm and generate 1375 Hp. The larger turbine was built to operate at 300 rpm and generate 2740 Hp. The smaller turbine has a 1,000 KVA Westinghouse AC Generator and the larger turbine has a 2250 KVA Westinghouse AC Generator. Both turbines are equipped with governors manufactured by the Woodward Governor Company of Rockford, Illinois. The surge tank was manufactured by Bethlehem Steel Company in 1939. The main switchboard and transformers were manufactured by the Westinghouse Corporation.

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In January 1941, the City of Abbeville announced official completion of the 7-year project, ending the City's 40-year dependence on the Duke Power Company. As compared with similar projects throughout the country, the Abbeville project was constructed at a very low cost. Engineers from the PWA and Charleston, South Carolina, agreed that "Abbeville has a gold mine on top of the ground." Due to low construction cost, the project was expected to show a greater profit per invested dollar than any hydroelectric project in the country. The City received a grant of \$236,000 from the Public Works Administration, a premium of \$20,000 on the bonds, and issued bonds of \$405,000, bringing the total cost to approximately \$500,000.

In February 1941, the Rural Electrification Authority financed power lines for the Little River Electric Co-operative to serve 450 farms in three counties. On March 1, 1941, the City of Abbeville began receiving power from its municipally owned hydroelectric plant. In April, the rural lines began to carry power. In July, Abbeville Mills Corporation, a cotton textiles manufacturer, became the largest single consumer of electricity from the Rocky River plant. All electricity from the plant was subscribed for within 6 months of the plant's opening.¹⁰

By November 1945, approximately 30 percent of the power used by Abbeville's electric system was purchased from the Greenwood County Electric Power Commission's nearby Buzzard's Roost Power Plant. To reduce the dependency on the Buzzard's Roost plant, City Engineer C. P. Townsend recommended acquisition of a diesel electric generating unit for the Rocky River Hydroelectric Plant. The diesel would be used in times of little rainfall and low water when the capacity of the hydroelectric plant was reduced. The fully subscribed power was sold retail to customers on the rural lines in the town of Lowndesville and the City of Abbeville, and was sold wholesale to Greenwood County Electric Power Commission, Little River Electric Co-Operative, Abbeville Mills Corporation, the City of Abbeville (for street lighting, etc.), the Seaboard Railway, and other local industries. The Abbeville Water and Electric Plant Company financed \$175,000 for the diesel and plant addition with revenue bonds,¹¹ so that there would be no increase in city taxes or electric rates.

In January 1946, the Abbeville City Council accepted the bid of \$115,673 for a new diesel engine by the Bush Sulzer Brothers Company of St. Louis, Missouri. The diesel engine was acquired to supply approximately 1,500 KVA as auxiliary power to the 3,200 KVA produced by the two hydro turbines. A Westinghouse generator and excitor, switchboard panel additions, and two diesel fuel storage tanks (capacity 15,000 and 25,000 gallons) were also acquired. A \$20,000 brick addition was made to the west end of the power house to accommodate the diesel engine, generator and auxiliary equipment. At this time, the ceiling-mounted 15-ton capacity crane runway, manufactured by Mark Brothers of Philadelphia, Pennsylvania, was extended into the new two-story brick addition. The Bush Sulzer diesel engine No. 1664 arrived in late October 1946. Installation was expected to take two months.¹²

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For the last 40 years, the Abbeville Hydroelectric Power Plant has been producing low-cost electricity for the customers of this small municipal corporation. Today Secession Lake Dam is intact and, including intake gate and east abutment, is 400' long. The dam supports a highway bridge for Abbeville County Road 72. An engineering report of the dam was completed in 1979 by Charles T. Mann, Inc., as a part of the National Dam Safety Program for the Charleston District of the U.S. Army Corps of Engineers. A house located west of the bridge was formerly occupied by the supervisor of the power plant.

Secession Lake has an elevation of approximately 548'. Water not directed through the intake gates on the west end of the dam is wasted through a gated spillway located southwest of the dam. Water directed through the penstocks, into the turbines, and out the tail race returns to the natural channel of the Rocky River. Approximately one-quarter mile downstream, the¹³ race water is reunited with the water directed through the spillway.

The unique features of the site are the multiple arched reinforced concrete dam and the original 1940 turbine installations, which are in service daily. The Richard B. Russell Dam and Lake Project's reservoir will back water up to the tail race of the power plant. The future of the site is uncertain. The Historic American Engineering Record documented the site with photographs and a brief history during the summer of 1980 for the Savannah District of the U.S. Army Corps of Engineers.

Footnotes:

1. Faunt, Joan R., ed. History of the Class of 1910, University of South Carolina, Columbia, S.C.: Class of 1910, 1961, pp. 133-134; City of Abbeville, Book of Charters I, p. 63; the charter was approved by the State February 3, 1934, and canceled October 24, 1945.

The Press & Banner and Abbeville Medium, January 9, February 9, March 23, 1933.

2. PB & A Medium, February 9, June 22, September 14, 1933.

3. PB & A Medium, January 11, May 10, June 28, November 8, 1934.

4. PWA Project No. S C 1011-P; PB & A Medium, May 16, June 24, July 18, August 1, 1935.

5. PB & A Medium, October 3, 1935; February 24, 1936; October 8, November 9, June 28, 1937.

6. Abbeville County Deed Book 63, pp. 348-364; PB & A Medium, August 24, 31, 1939; March 7, 1940.

7. PB & A Medium, December 14, 1939; January 25, March 21, April 4, May 2, September 5, November 14, 21, 28, December 5, 19, 1940.

8. Equipment tags, original catalogs and maintenance records were not available.

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9. PB & A Medium, January 2, 23, 1941.
10. PB & A Medium, February 27, March 6, 13, April 24, May 29, July 10, October 30, 1941.
11. Townsend, C. P. "Electric Light and Power System of City of Abbeville South Carolina," Abbeville, S.C.: Abbeville Water and Electric Plant, November 1, 1945.
12. Ibid.; PB & A Medium, January 10, October 31, 1946.
13. Main, Charles T., Inc. Lake Secession Dam, Abbeville, S. C., Rocky River, Savannah River Basin, Phase One Inspection Report, National Dam Safety Program. Inventory No. SC 00247. Charleston, S.C.: District U. S. Army Corps of Engineers, June 1979.

Addendum to
Abbeville Hydroelectric Power Plant
County Road 72
Rocky River
Abbeville County
South Carolina

HAER No. SC-5

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PHOTOGRAPHS